PATENT
Attorney Docket No.: 2000IP000227

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of:	Neal G. Skinner
Serial No.:	09/932,639
Filed:	August 17, 2001
Entitled:	MULTIPLEXED DISTRIBUTION OF OPTICAL POWER
Group Art Unit:	2633
Examiner:	R. Sedighian

SUPPLEMENTAL APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant hereby timely submits this Supplemental Appeal Brief in triplicate under the provisions of 37 CFR §1.192(a) and respectfully requests consideration thereof before the Board of Patent Appeals and Interferences. Appellant's Notice of Appeal was filed on July 15, 2003, appealing to the Board from the decision of the examiner, mailed April 21, 2003, rejecting all of the pending claims of the above-identified patent application.

A subsequent Office Action dated November 17, 2003 reopened prosecution in the application, and applied new grounds of rejection. Although the examiner has now allowed some of the claims, and has now indicated that others of the claims contain allowable subject matter, the new grounds of

rejection are still improper. Consequently, appellant has requested reinstatement of the appeal under the provisions of 37 CFR §1.193(b)(2)(ii).

REAL PARTY IN INTEREST

The real party in interest is the assignee of the present application, Halliburton Energy Services, Inc. of Dallas, Texas.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to appellant, the appellant's legal representatives or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF CLAIMS

Claims 1-61 were originally filed in the present application. By an Amendment filed August 5, 2002, claims 1-10, 14-18, 21-24, 26, 29, 31-38 and 41-43 were canceled. Claims 11-13, 19, 20, 25, 27, 28, 30, 39, 40 and 44-61 remain pending.

Claims 11-13, 27 and 28 are now allowed.

Claims 46, 50, 51 and 59-61 are now indicated as containing allowable subject matter, but are objected to for depending from a rejected base claim.

Claims 19, 20, 25, 30, 39, 40, 44, 45, 47-49 and 52-58 are rejected on new grounds. Each of these claims has been rejected at least twice by the examiner, and these rejections are respectfully appealed.

STATUS OF AMENDMENTS

No amendment has been filed subsequent to any final rejection. The claims as set forth in Appendix A include changes to the claims made according to the Amendment filed August 5, 2002, which was entered by the examiner.

SUMMARY OF THE INVENTION

The present invention advances the art of selectively supplying electrical power and transmitting data to multiple well tools. In several of the embodiments described in the specification, each well tool is selected by transmitting a particular optical wavelength band through a single optical fiber. This use of a single optical fiber to permit selection from among multiple well tools reduces the cost and complexity which would be associated with using multiple optical fibers or electrical conductors in a well to communicate with or supply power to the multiple well tools.

The selection of a well tool is accomplished by transmitting the corresponding optical wavelength band through the optical fiber. A control module connected to the well tool receives the optical wavelength band. Each well tool has a control module connected thereto. A well tool is selected when its corresponding control module receives the corresponding optical wavelength band.

If a control module of a well tool receives its corresponding optical wavelength band, then an opto-electric converter associated with the control

module converts the light transmitted thereto into electrical power. This electrical power may be used to power or actuate the well tool. Alternatively, or in addition, data may be transmitted to the well tool by intermittently transmitting the corresponding optical wavelength band (to transmit digital 1's and 0's) or by varying the intensity of the light transmitted in the optical wavelength band (to transmit analog data).

Multiple well tools may be selected by simultaneously transmitting corresponding multiple optical wavelength bands through the optical fiber. Multiple well tools may also be selected by configuring their associated control modules to respond to the same optical wavelength band transmitted through the optical fiber.

ISSUES

Whether claim 56 is properly rejected under 35 USC §112, second paragraph, as being indefinite.

Whether claims 25 and 30 are properly rejected under 35 USC §102(b) as being anticipated by U.S. Patent No. 4,495,421 to Endo et al.

Whether claim 19 is properly rejected under 35 USC §103(a) as being unpatentably obvious over U.S. Patent No. 4,928,319 to Pitt et al. in view of U.S. Patent No. 4,941,201 to Davis.

Whether claim 20 is properly rejected under 35 USC §103(a) as being unpatentably obvious over Pitt in view of U.S. Patent No. 5,193,201 to Tymes.

Whether claims 39, 40, 44, 45, 47-49 and 52-58 are properly rejected under 35 USC §103(a) as being unpatentably obvious over Endo.

GROUPING OF CLAIMS

Although each of claims 25 and 30 stands rejected as being anticipated by Endo, the claims of this group do not stand or fall together. Each of claims 39, 40, 44, 45, 47-49 and 52-58 stands rejected as being obvious over Endo, but other than claims 44, 49, 54 and 55, the claims of this group also do not stand or fall together. Each of claims 19, 20 and 56 is rejected on separate grounds, and so each of these claims does not stand or fall with any other claim.

Instead, appellant submits that each of the rejected claims stands on its own recitation, and each claim is considered separately patentable for reasons set forth in more detail below, with the exception of claims 44, 49, 54 and 55 which stand or fall together.

ARGUMENT

Rejection under 35 USC §112, 2nd paragraph

Claim 56 is rejected as being indefinite for failure to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. The examiner's basis for this rejection, as stated in section 3 of the November 17, 2003 Office Action, is as follows:

> As to claim 56, it is not clear about "... electrical power is supplied to the selected well tools in a manner which transmits data in a

> selected one of digital and analog form." Claim 44 which claim 56 depends on, recites a control system to selectively supply power to multiple electrical power consuming well tools, and does not recite transmission of data. (emphasis in original)

The examiner is correct that claim 56 recites subject matter not recited in claim 44. The examiner is also correct that claim 56 is dependent from claim 44. What the examiner does not appreciate, however, is that the very purpose of a dependent claim is to recite subject matter not recited in a claim from which it depends.

If a dependent claim were rendered indefinite merely because it recites additional subject matter, then only independent claims would be allowable.

The specification clearly describes a well tool control system in which electrical power is selectively supplied to well tools, and in which the electrical power is supplied in a manner which transmits data. Appellant is entitled to recite these separate aspects of the invention in separate claims. No patent law or rule requires all aspects of an invention to be recited in a single claim, or requires that only independent claims be used to define the invention.

Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 56.

Rejections under 35 USC §102(b)

Claims 25 and 30 are rejected as being anticipated by Endo.

Claim 25 recites an electrical power distribution system which includes multiple control modules interconnected between a fiber optic line and respective ones of multiple power consuming devices. Each of multiple optical wavelength bands is transmitted through the fiber optic line to cause a corresponding one of the control modules to select the respective power consuming device for supplying electrical power thereto. The optical wavelength bands are transmitted through the fiber optic line **singly** (i.e., without the company of others; individually. Merriam Webster's Collegiate Dictionary, Tenth Edition, 1993).

Endo does describe transmission of multiple optical wavelengths being used to provide power to multiple devices in an automobile. However, Endo is not directed to the problem solved by the present invention, and does not provide the benefits of the present invention. Specifically, Endo is directed to the problem of preventing electromagnetic interference in audio systems of automobiles.

At the outset it should be noted that, instead of selectively supplying power or transmitting data to multiple devices using a single optical fiber as in the embodiments described in the present application, Endo requires: 1) an optical fiber 40, 2) an electrical power supply line 50, and 3) multiple optical fibers extending to each of multiple optical filters 12-1, 12-2, 12-3 (see FIG. 4 of Endo). Note, also, that Endo does not use the electrical power generated by the light transmitted through the optical fiber 40 to power the devices in the automobile. Instead, Endo merely uses the transmitted light to operate a switch which allows

electrical power to flow to the device from the separate electrical power supply line 50.

Endo does not anticipate claim 25, at least in part because Endo does not describe transmitting the multiple optical wavelength bands singly through the fiber optic line. Instead, Endo describes transmitting multiple optical wavelengths **simultaneously** through the optical fiber.

In col. 5, lines 1-7, Endo describes how the multiple optical wavelengths are produced: "... [O]ptical switches 20-1, 20-2 and 20-3 are turned on by the driver, respective optical signals Sp1, Sp2 and Sp3 having specific wavelengths $\lambda 1$, $\lambda 2$ and $\lambda 3$ are produced by respective optical signal switches 20-1, 20-2 and 20-3 ... ." Thus, the optical wavelengths are produced **simultaneously**.

In col. 5, lines 7-15, Endo describes how the multiple optical wavelengths are transmitted through the optical fiber: "... [The optical wavelengths] next are conducted to a light collector 11 through respective optical fibers 40-1, 40-2 and 40-3. The optical signals Sp1, Sp2 and Sp3 are collectively introduced into an optical fiber 40 via respective directional coupler 11-1, 11-2 or 11-3 by which the optical signals are selectively directed toward the optical fiber 40 in such a way that all of the optical signals can be conducted together by the fiber 40." Again, Endo describes **simultaneous** transmission of the optical wavelengths.

In col. 5, lines 18-20, Endo describes how the multiple optical wavelengths are divided out: "In this light divider 12, the composite optical signal is separated by three optical wavelength filters 12-1, 12-2 and 12-3." The "composite"

optical signal clearly refers to the multiple optical wavelengths transmitted **simultaneously** through the optical fiber.

Therefore, it may be seen that Endo does not anticipate the invention recited in claim 25, and for at least this reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 25.

Claim 30 recites an electrical power distribution system in which electrical power is selectively supplied to multiple power consuming devices. An optical coupler interconnected to a fiber optic line receives separate optical wavelength bands from multiple lasers, at least one of which is a tunable laser. As discussed above in relation to claim 25, Endo transmits multiple optical wavelengths **simultaneously** and, thus, cannot selectively supply electrical power to multiple power consuming devices.

Instead, Endo supplies electrical power to **all** of the power consuming devices at the same time. There is no selectivity in the Endo system, other than selecting whether to turn the devices on or off. For at least this reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 30.

Furthermore, Endo does not teach the use of tunable lasers to transmit any of the optical wavelength bands through an optical fiber in order to selectively supply electrical power to multiple devices. In paragraph 4 of the April 21, 2003 Office Action, the examiner acknowledged this deficiency of the Endo reference: "Endo differs from the claimed invention in that Endo does not

specifically disclose respective multiple tunable lasers for producing the optical signals."

For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 30.

Rejections under 35 USC §103(a)

Claims 39, 40, 44, 45, 47-49 and 52-58 are rejected as being obvious over Endo alone.

Claim 39 recites an electrical power distribution system in which multiple control modules are interconnected between a fiber optic line and respective ones of multiple power consuming devices. The power consuming devices are data storage devices. Electrical power is supplied to a selected data storage device when a corresponding optical wavelength band is transmitted through the fiber optic line to the respective control module.

Endo is directed to supplying power to devices in an automobile without causing radio interference. Endo does not describe supplying electrical power to any data storage device, or supplying power to selected ones of multiple data storage devices. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 39, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 39.

Furthermore, there is no motivation for a person skilled in the art to modify Endo as proposed by the examiner. Endo is directed to a completely different problem (preventing radio interference in an automobile). A skilled

artisan would not see Endo as teaching or suggesting a system for selectively supplying electrical power to multiple data storage devices. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 39.

Claim 40 recites an electrical power distribution system in which multiple control modules are interconnected between a fiber optic line and respective ones of multiple power consuming devices. The power consuming devices have programmed functions. The selected devices perform their respective functions in response to electrical power being supplied thereto.

Endo does not describe any devices having programmed functions, and does not describe such devices performing their respective functions when electrical power is supplied thereto. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 40. For this reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 40.

In addition, there is no motivation for a person skilled in the art to modify Endo as proposed by the examiner. Endo is directed to a completely different problem (preventing radio interference in an automobile). A skilled artisan would not see Endo as teaching or suggesting a system for selectively causing programmed functions to be performed by selectively supplying electrical power to programmed devices. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 40.

Claim 44 recites a well tool control system in which electrical power is selectively supplied to multiple well tools in a well. The system uses a fiber optic line extending in the well to multiple control modules associated with respective ones of the well tools. Each of the control modules is responsive to one of multiple optical wavelength bands transmitted through the fiber optic line to cause light to be transmitted to a respective opto-electric converter and thereby cause electrical power to be supplied to the respective well tool. Claims 49, 54 and 55 are dependent from claim 44 and, therefore, include each of the limitations of claim 44.

Endo does not describe supplying electrical power to well tools at all. Instead, Endo describes preventing interference with radio reception by supplying electrical power via switches 30-1, 30-2, 30-3 (see FIG. 4) in close proximity to devices in an automobile. Furthermore, Endo does not describe extending the fiber optic line into a subterranean well. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claims 44, 49, 54 and 55, and for this reason the Board is respectfully requested to direct the examiner to withdraw these rejections of claims 44, 49, 54 and 55.

Furthermore, a person skilled in the art would not be motivated by the teachings of Endo to produce the well tool control system of claim 44 in which electrical power is selectively supplied to multiple well tools in a well. As discussed above, Endo does not describe selectivity in supplying electrical power to multiple devices. A skilled artisan would not look to Endo (which is directed to preventing radio interference in an automobile) for any teaching or suggestion

of how to selectively supply electrical power to multiple well tools in a well. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw these rejections of claims 44, 49, 54 and 55.

Claim 45 is dependent from claim 44 and, thus, is not rendered obvious by the teachings of Endo for the same reasons discussed above in relation to claim 44. Claim 45 further recites that each of the control modules includes a WDM drop interconnected between the fiber optic line and the respective well tool. The term "WDM drop" is well understood by those skilled in the art, and it is clear that Endo does not teach or suggest the use of any WDM drop.

Instead, Endo teaches that the optical fiber 40 should be split at its terminal end in a divider 12, and the light transmitted through the optical fiber should be directed to individual optical filters 12-1, 12-2, 12-3. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 45. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 45.

A WDM drop is completely different from the divider 12 of Endo. As described in the specification of the present application on page 6:

> The control module 22 includes a wavelength division multiplexing (WDM) drop 38 interconnected to the fiber optic line 18. The WDM drop 38 is responsive to a certain optical wavelength band $\lambda 1$. When the optical wavelength band $\lambda 1$ is transmitted through the fiber optic line 18, the WDM drop 38 directs light from the fiber optic line to an opto-electric converter 40 interconnected between the control module 22 and the well tool 12. All wavelengths other than the optical wavelength band $\lambda 1$ pass through the WDM drop 38 unaffected.

One beneficial feature of using a WDM drop is that all optical wavelength bands, other than the optical wavelength band to which the WDM drop is responsive, pass through the WDM drop unaffected. In this manner, only one fiber optic line is needed to transmit multiple optical wavelength bands to the multiple control modules. The divider 12 and optical filters 12-1, 12-2, 12-3 of Endo do just the **opposite**. The divider 12 requires splitting the optical fiber 40 at its terminal end into three separate optical fibers, and the optical filters 12-1, 12-2, 12-3 only pass a single optical wavelength each.

A person skilled in the art would definitely not be motivated to produce the invention recited in claim 45 based on the teachings of Endo. Instead, the skilled artisan would be motivated by Endo to use a divider and multiple optical filters. Endo certainly does not suggest the invention recited in claim 45.

Therefore, for this additional reason, claim 45 is not rendered obvious by the teachings of Endo, and the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 45.

Claim 47 is dependent from claim 44 and, thus, is not rendered obvious by the teachings of Endo for the same reasons discussed above in relation to claim 44. Claim 47 further recites that each of the control modules includes an optical coupler interconnected to the fiber optic line, and an optical filter interconnected between the optical coupler and the power consuming device. Since there are multiple control modules and each control module includes an optical coupler,

claim 47 requires that the system include multiple optical couplers, each of which is interconnected to the fiber optic line.

Endo does not describe such a system. Instead, Endo describes the use of a single divider 12 connected at a terminal end of the optical fiber 40. This might be a practical solution for use in an automobile where the power consuming devices are all in close proximity to each other. However, in a well where multiple well tools may be spaced apart from each other by thousands of feet, this certainly is not a practical solution. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 47. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 47.

The use of the multiple optical couplers in multiple control modules as recited in claim 47 enables a single fiber optic line to be used in conjunction with well tools widely spaced apart in a well. Endo does not even contemplate this problem, much less provide or suggest a solution to the problem. The teachings of Endo would certainly not motivate a person skilled in the art to develop the invention of claim 47. Therefore, for this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 47.

Claim 48 is dependent from claim 44 and, thus, is not rendered obvious by the teachings of Endo for the same reasons discussed above in relation to claim

44. Claim 48 further recites that the multiple optical wavelength bands are transmitted singly through the fiber optic line.

As discussed above in relation to claim 25, Endo teaches simultaneous transmission of multiple optical wavelengths through an optical fiber. Endo does not teach selective operation of multiple well tools by transmitting optical wavelength bands singly through the optical fiber. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 48. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 48.

In addition, a skilled artisan would definitely not be motivated by the teachings of Endo to produce the invention of claim 48. Endo teaches directly away from transmitting multiple optical wavelengths singly through a fiber optic line to selectively supply electrical power to multiple well tools. Therefore, for this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 48.

Claim 52 is dependent from claim 49 and, thus, the reasons given above for the impropriety of the obviousness rejections of claims 44 and 49 also apply to the obviousness rejection of claim 52. In addition, claim 52 recites that the system of claim 49 further includes an optical coupler receiving separate optical wavelength bands from multiple lasers.

Endo describes a light emitting diode 22 being used to transmit light through an optical fiber 40. This might be sufficient for use in an automobile,

where the light does not have to be transmitted very far, but it would be impractical for use in a well where the light may need to be transmitted many thousands of feet. In FIG. 4, multiple optical signal switches 20-1, 20-2, 20-3 are depicted, but still there is no description of multiple lasers, or separate optical wavelength bands being transmitted from the multiple lasers. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 52, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 52.

Furthermore, Endo does not describe an optical coupler receiving the separate optical wavelength bands from multiple lasers. Instead, Endo describes separate couplers 11-1, 11-2, 11-3, each of which receives only a single optical wavelength from a corresponding optical signal switch 20-1, 20-2, 20-3. Clearly, a skilled artisan would not be motivated by these teachings of Endo to produce the very different invention recited in claim 52. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 52.

Claim 53 is dependent from claim 52, which is dependent from claim 49. Thus, the reasons given above for the impropriety of the obviousness rejections of claims 44 and 52 also apply to the obviousness rejection of claim 53. In addition, claim 53 recites that at least one of the multiple lasers is a tunable laser.

As discussed above in relation to claim 52, Endo describes the use of an individual light emitting diode 22 to transmit a specific optical wavelength.

Endo does not describe the use of any tunable light source, much less the use of a tunable laser. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 53. In addition, a person skilled in the art would be motivated away from the use of a tunable laser by the teachings of Endo.

Therefore, for these additional reasons, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 53.

Claim 56 is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejection of claim 56. In addition, claim 56 recites that electrical power is supplied to the selected well tools in a manner which transmits data in a selected one of digital and analog form.

Endo does not describe data transmission at all. Instead, Endo describes a system for merely turning devices in an automobile on or off. Endo certainly does not describe or suggest supplying electrical power in a manner which transmits data in either digital or analog form. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 56. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 56.

A person skilled in the art would not be motivated by the teachings of Endo to produce the invention recited in claim 56. Rather, the skilled artisan would be motivated to merely supply electrical power to various automotive electrical devices, not to transmit data to the devices. Therefore, for this additional reason,

the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 56.

Claim 57 is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejection of claim 57. In addition, claim 57 recites that the well tools are data storage devices. As discussed above, Endo does not even mention or suggest the use of well tools in a well, much less describe the use of well tools as data storage devices.

Therefore, the examiner has failed to make out a *prima facie* case of obviousness of claim 57, and for this additional reason the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 57.

Clearly, a skilled artisan would not be motivated by the teachings of Endo to use well tools as data storage devices, or to selectively supply power to the data storage well tools in a well as recited in claim 57. Endo does not even remotely suggest these features of the present invention. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 57.

Claim 58 is dependent from claim 44 and, thus, the reasons given above for the impropriety of the obviousness rejection of claim 44 also apply to the obviousness rejection of claim 58. In addition, claim 58 recites that the well tools are devices having programmed functions, and that each of the devices performs its respective function in response to electrical power being supplied thereto.

Endo does not describe or suggest the use of well tools, or the use of well tools having programmed functions. Endo also does not describe or suggest the use of well tools which perform programmed functions in response to electrical power being supplied thereto. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of claim 58. For this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 58.

Furthermore, Endo would not motivate any person skilled in the art to cause selected ones of multiple well tools to perform a programmed function by supplying electrical power thereto. There simply is no basis on which to support such a motivation, given the teachings of Endo. Therefore, for this additional reason, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 58.

Claim 19 is rejected as being obvious over a combination of the Pitt and Davis references. This claim recites a method wherein multiple optical wavelength bands are transmitted through an optical fiber to selectively supply electrical power to corresponding multiple devices. The wavelength bands are selectively transmitted to thereby select which of the corresponding devices are to be supplied with electrical power. The devices are data storage devices, and data transmitted through the fiber optic line is stored in the devices selected by the transmission of the wavelength bands.

In contrast, Pitt does not describe supplying electrical power to selected ones of multiple power consuming devices. Instead, Pitt describes supplying electrical power to a single power consuming device. Although multiple lasers may be used in the system of Pitt, these lasers do not transmit multiple optical wavelength bands. Rather, the multiple lasers are used to increase the level of optical power transmitted through an optical fiber, not to select from among multiple devices to supply power.

Davis is used by the examiner merely for its teaching of combined power and data transmission to a data storage device. However, Davis still does not teach the transmission of multiple optical wavelength bands to select from among multiple data storage devices for supplying electrical power thereto. Davis also does not teach the transmission of data through a fiber optic line.

The combination of the teachings of Pitt and Davis suggested by the examiner would definitely not produce the invention recited in claim 19. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 19.

Furthermore, a person skilled in the art would find no motivation to combine the teachings of Pitt and Davis in the manner proposed by the examiner. This is merely a case of the examiner attempting to use the claim as a recipe to go out and find references having individual elements of the claim, and then asserting that it would be obvious to combine the references. The Board is respectfully requested to direct the examiner to withdraw this rejection of claim 19.

Claim 20 is rejected as being obvious over a combination of Pitt with Tymes. As discussed above in relation to claim 19, Pitt does not teach the selective supplying of power to multiple devices by transmitting respective ones of multiple optical wavelength bands. Instead, Pitt is merely directed to the problem of supplying a maximum amount of optical power over a single optical fiber.

Claim 20 recites that the devices have programmed functions, and that the devices perform these functions when supplied with electrical power. Tymes is used by the examiner for its teaching of the supplying of power to a microprocessor (a device having a programmed function). However, Tymes still does not describe the selective aspects of the invention recited in claim 20. The light transmitted in Tymes does not select from among multiple power consuming devices at all.

The combination of the Pitt and Tymes references suggested by the examiner would clearly not result in the invention recited in claim 20. Thus, the examiner has failed to make out a *prima facie* case of obviousness of claim 20

Furthermore, there is no motivation to combine the Pitt and Tymes references as suggested by the examiner. Again, the examiner has found some of the elements recited in the claim in separate references, and has made the unsupported assertion that it would be obvious to combine the references. Not only are the references deficient in that they do not contain all of the limitations of claim 20, but there is also no motivation to combine the references as asserted

by the examiner. Therefore, the Board is respectfully requested to direct the examiner to withdraw this rejection of claim 20.

CONCLUSION

For the foregoing reasons, it is submitted that the examiner's rejections of claims 19, 20, 25, 30, 39, 40, 44, 45, 47-49 and 52-58 in the November 17, 2003 Office Action are in error, and reversal of his decisions is respectfully requested.

Respectfully submitted,

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APPENDIX A

[The claims as rejected]

11. A method of providing electrical power to multiple power consuming devices, the method comprising the steps of:

interconnecting each of the power consuming devices to a fiber optic line, so that each of the power consuming devices is selectable for operation thereof by transmitting one of multiple optical wavelength bands through the fiber optic line, and wherein each of the transmitted optical wavelength bands causes a respective at least one of the power consuming devices to be selected; and

transmitting various of the optical wavelength bands through the fiber optic line, thereby supplying electrical power to corresponding selected ones of the power consuming devices,

the transmitting step further comprising simultaneously transmitting multiple ones of the optical wavelength bands through the fiber optic line, thereby selecting corresponding multiple ones of the power consuming devices for operation thereof,

the multiple optical wavelength bands being transmitted through the fiber optic line by interconnecting a first optical coupler to the fiber optic line, the first optical coupler receiving separate optical wavelength bands from multiple tunable filters.

12. The method according to Claim 11, wherein each of the tunable filters is interconnected between the first optical coupler and a second optical

coupler, each of the tunable filters receiving a relatively broad optical wavelength band from the second optical coupler.

13. A method of providing electrical power to multiple power consuming devices, the method comprising the steps of:

interconnecting each of the power consuming devices to a fiber optic line, so that each of the power consuming devices is selectable for operation thereof by transmitting one of multiple optical wavelength bands through the fiber optic line, and wherein each of the transmitted optical wavelength bands causes a respective at least one of the power consuming devices to be selected; and

transmitting various of the optical wavelength bands through the fiber optic line, thereby supplying electrical power to corresponding selected ones of the power consuming devices,

the transmitting step further comprising simultaneously transmitting multiple ones of the optical wavelength bands through the fiber optic line, thereby selecting corresponding multiple ones of the power consuming devices for operation thereof,

the multiple optical wavelength bands being transmitted through the fiber optic line by interconnecting an optical coupler to the fiber optic line, the optical coupler receiving separate optical wavelength bands from respective multiple tunable lasers.

19. A method of providing electrical power to multiple power consuming devices, the method comprising the steps of:

interconnecting each of the power consuming devices to a fiber optic line, so that each of the power consuming devices is selectable for operation thereof by transmitting one of multiple optical wavelength bands through the fiber optic line, and wherein each of the transmitted optical wavelength bands causes a respective at least one of the power consuming devices to be selected; and

transmitting various of the optical wavelength bands through the fiber optic line, thereby supplying electrical power to corresponding selected ones of the power consuming devices,

the power consuming devices being data storage devices, and wherein in the transmitting step, data transmitted through the fiber optic line is stored in corresponding selected ones of the data storage devices.

20. A method of providing electrical power to multiple power consuming devices, the method comprising the steps of:

interconnecting each of the power consuming devices to a fiber optic line, so that each of the power consuming devices is selectable for operation thereof by transmitting one of multiple optical wavelength bands through the fiber optic

line, and wherein each of the transmitted optical wavelength bands causes a respective at least one of the power consuming devices to be selected; and

transmitting various of the optical wavelength bands through the fiber optic line, thereby supplying electrical power to corresponding selected ones of the power consuming devices,

the power consuming devices being devices having programmed functions, and wherein in the transmitting step, the functions are performed in response to the supplying of electrical power to the corresponding selected ones of the devices.

25. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices; and

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto,

the multiple optical wavelength bands being transmitted singly through the fiber optic line.

27. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices;

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto; and

multiple tunable filters and a first optical coupler interconnected to the fiber optic line, the first optical coupler receiving separate optical wavelength bands from the multiple tunable filters.

28. The system according to Claim 27, wherein each of the tunable filters is interconnected between the first optical coupler and a second optical

coupler, each of the tunable filters receiving a relatively broad optical wavelength band from the second optical coupler.

30. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices;

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto, the multiple optical wavelength bands being transmitted simultaneously through the fiber optic line; and

an optical coupler interconnected to the fiber optic line, the optical coupler receiving separate optical wavelength bands from multiple lasers, at least one of the multiple lasers being a tunable laser.

39. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices; and

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto,

the power consuming devices being data storage devices.

40. An electrical power distribution system, comprising:

a fiber optic line;

multiple power consuming devices; and

multiple control modules interconnected between the fiber optic line and the power consuming devices, each of the control modules being interconnected between the fiber optic line and one of the power consuming devices, and each of the control modules being operative to select the respective power consuming device for supplying electrical power thereto in response to one of multiple optical wavelength bands transmitted through the fiber optic line, each of the

optical wavelength bands causing one of the control modules to select the respective power consuming device for supplying electrical power thereto,

the power consuming devices being devices having programmed functions, each of the devices performing its respective function in response to electrical power supplied thereto.

44. A well tool control system for selectively supplying electrical power to multiple electrical power consuming well tools in a subterranean well, the system comprising:

a fiber optic line extending in the well;

multiple control modules interconnected to the fiber optic line; and

multiple opto-electric converters, each of the opto-electric converters being interconnected between a respective one of the control modules and a respective one of the well tools, and

wherein each of the control modules is responsive to one of multiple optical wavelength bands transmitted through the fiber optic line to cause light to be transmitted to the respective opto-electric converter and thereby cause electrical power to be supplied to the respective well tool.

45. The system according to Claim 44, wherein each of the control modules includes a WDM drop interconnected between the fiber optic line and the respective well tool.

46. The system according to Claim 45, wherein each of the WDM drops includes an optical circulator and a Bragg grating interconnected to the fiber optic line.

47. The system according to Claim 44, wherein each of the control modules includes an optical coupler interconnected to the fiber optic line and an optical filter interconnected between the optical coupler and the power consuming device, the optical filter passing a selected one of the optical wavelength bands.

48. The system according to Claim 44, wherein the multiple optical wavelength bands are transmitted singly through the fiber optic line.

49. The system according to Claim 44, wherein the multiple optical wavelength bands are transmitted simultaneously through the fiber optic line.

50. The system according to Claim 49, further comprising multiple tunable filters and a first optical coupler interconnected to the fiber optic line, the first optical coupler receiving separate optical wavelength bands from the multiple tunable filters.

51. The system according to Claim 50, wherein each of the tunable filters is interconnected between the first optical coupler and a second optical coupler, each of the tunable filters receiving a relatively broad optical wavelength band from the second optical coupler.

52. The system according to Claim 49, further comprising an optical coupler interconnected to the fiber optic line, the optical coupler receiving separate optical wavelength bands from multiple lasers.

53. The system according to Claim 52, wherein at least one of the multiple lasers is a tunable laser.

54. The system according to Claim 44, wherein each of the opto-electric converters is connected to a switch interconnected between at least one power supply and the respective well tool.

55. The system according to Claim 54, wherein the switch is a field effect transistor.

56. The system according to Claim 44, wherein electrical power is supplied to the selected well tools in a manner which transmits data in a selected one of digital and analog form.

57. The system according to Claim 44, wherein the well tools are data storage devices.

58. The system according to Claim 44, wherein the well tools are devices having programmed functions, each of the devices performing its respective function in response to electrical power being supplied thereto.

59. The system according to Claim 44, further comprising at least one sensor interconnected in the fiber optic line.

60. The system according to Claim 59, wherein the sensor includes an intrinsic fiber Bragg grating.

61. The system according to Claim 59, wherein there are multiple sensors interconnected in the fiber optic line.